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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,891	03/20/2006	Bert Braune	502902-225PUS	3003

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EXAMINER	
WILLIAMS, AARON	
ART UNIT	PAPER NUMBER
2889	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/572,891	BRAUNE ET AL.	
	Examiner	Art Unit	
	Aaron Williams	2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/20/2006, 11/26/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

The information disclosure statement (IDS) submitted on 11/26/2007 and 3/20/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

It is noted that the IDS contains an extremely large number of references. The examiner has considered all of the references that have been initialed, but has not found any to be particularly relevant. If applicant is aware of pertinent material in the references, an official statement should be made in a response to this Office action. Applicant is reminded of applicant's duty of disclosure pursuant MPEP § 2004:

It is desirable to avoid the submission of long lists of documents if it can be avoided. Eliminate clearly irrelevant and marginally pertinent cumulative information. If a long list is submitted, highlight those documents which have been specifically brought to applicant's attention and/or are known to be of most significance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 – 3, 7 – 10 are rejected under 35 U.S.C. 102(e) as being anticipated by US patent Grant Publication 2006/0011922 to Schmidt et al., herein refer to as Schmidt.

Regarding claim 1 Schmidt disclose in figures 1- 5, **a green-emitting LED which is designed as a luminescence conversion LED** (figure 1)**, comprising: a primary radiation source, which is a chip emitting in the UV or blue radiations region** (refer to paragraphs [0016] and [0025] where it is stated a light emitting device that is a Led that emits primary light of a first wavelength less then 480 nm)**; and a layer of a phosphor which is arranged in front of the primary radiation source** (refer to paragraph [0016] where it further discusses a phosphor screen composed of one or more phosphor) **and completely or partially converts the radiation of the chip into green light of dominant wavelength λ_{dom}=550 to 570 nm** (refer to paragraphs [0017] and [0037]. The graph of figure 3 shows the emission spectrum of the green phosphor $Sr_{.96}Si_2N_2O_2:Eu_{.04}$ after excitation on 460 nm) **; wherein the phosphor belongs to the class of the oxynitridosilicates, having a cation M and the empirical formula $M_{(1-c)}Si_2O_2N_2:D_C$, where D denotes a doping with divalent europium and where M comprises Sr as a constituent and M=Sr alone or M=$Sr_{(1-x-y)}Ba_yCa_x$ with $0\leq x+y<0.5$ is used, the oxynitridosilicate completely or**

predominantly comprising the high-temperature-stable modification HT. The general of the green phosphor is given in paragraph [0056] as $(Sr_{1-a-b}\ Ca_b\ Ba_c\ Mg_d\ Zn_e)Si_x\ N_y\ O_z:Eu_a$, wherein $0.002 \leq a \leq 0.2$, $0.0 \leq b \leq 0.25$, $0.0 \leq c \leq 0.25$, $0.0 \leq d \leq 0.25$, $0.0 \leq e \leq 0.25$, $1.5 \leq x \leq 2.5$, $1.5 \leq y \leq 2.5$ and $1.5 < z < 2.5$. The claimed subscripts of "**x**" is equivalent to the Schmidt's b, "**y**" is equivalent to Schmidt's c, "**c**" is equivalent to Schmidt's a. The claimed molar proportion of Si, O, and N all fall within the ranges of the prior art. Therefore the claimed green phosphor formula is clearly anticipated. Refer to paragraphs [0055] – [0058] further details.

Regarding claim 2 Schmidt disclose in figures 1- 5, **the LED as claimed in claim 1, wherein the Eu fraction makes up between 0.1 and 20 mol % of M.** Refer to paragraph [0057] where this range is anticipated.

Regarding claim 3 Schmidt disclose in figures 1- 5, **the LED as claimed in claim 1, wherein Sr represents the majority of M and a proportion of M, in particular up to 30 mol %, is replaced by Ba and/or Ca.** In the paragraph [0056] the ranges for the variables b and c anticipate this claim.

Regarding claim 7 Schmidt disclose in figures 1- 5, **the LED as claimed in claim 1, wherein the primary emission has a peak wavelength in the range from 380 to 430 nm, in particular at least 380 nm.** Refer to paragraph [0016].

Regarding claim 8 Schmidt disclose in figures 3, **the LED as claimed in claim 1, characterized in that wherein the green emission has a dominant wavelength in the range from 556 to 564 nm.** Paragraph [0037] and graph 3 anticipate this claim.

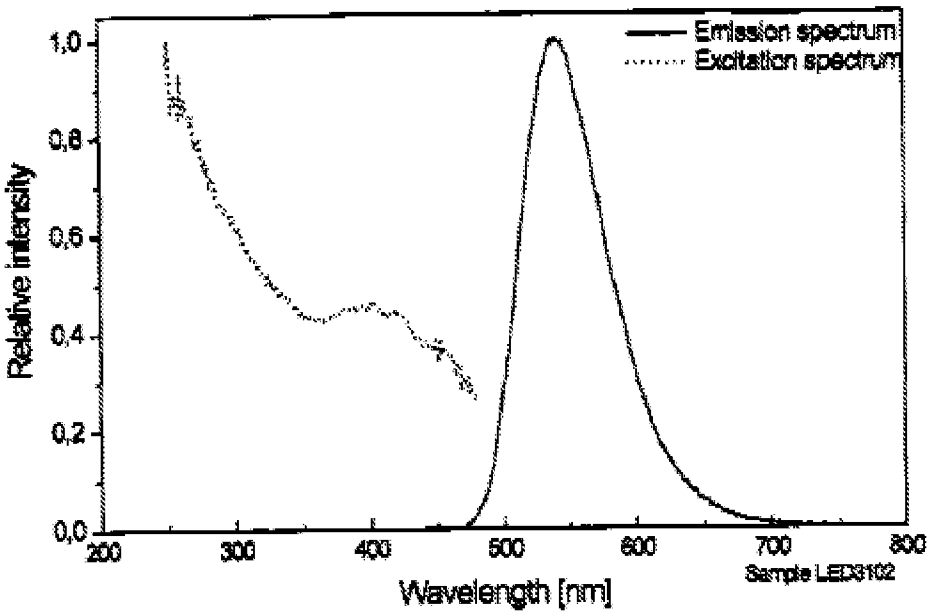
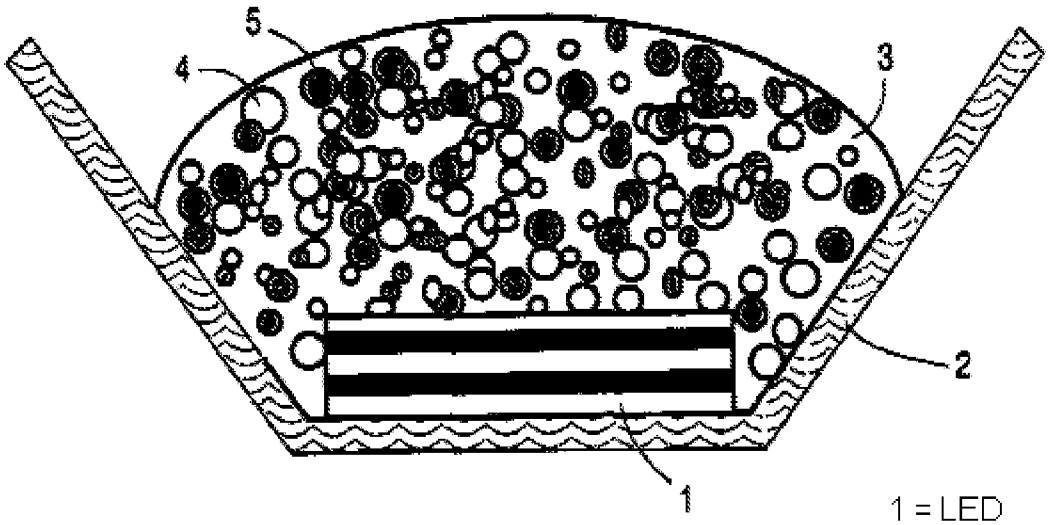


FIG. 3

Regarding claim 9 Schmidt disclose in figures 1- 5, **the LED as claimed in claim 1, wherein the primary radiation is completely converted.** Since the claimed chemical formula is completely anticipated by the prior art it is inherent that the primary radiation can be converted very efficiently. Refer to the picture below and paragraphs [0003] and [0051] for further details.



1 = LED
2 = Reflector Cup
3 = resin
4 = phosphor
5 = phosphor

FIG. 1

Regarding claim 10 Schmidt disclose in figure 3, **the LED as claimed in claim 1, wherein the chip is an InGaN chip with a peak emission wavelength in the range from 430 to 465 nm.** Refer to figure 3 above and paragraph [0048] where emission radiation is given off (In, Ga)N diode.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 4 - 6 rejected under 35 U.S.C. 103(a) as being unpatentable over US patent Grant Publication 2006/0011922 to Schmidt et al., herein refer to as Schmidt, as applied to claims 1- 3, 7 - 10 above, and further in view of US Patent Grant Publication 2003/0094893 to Ellens et al., herein refer to as Ellens.

Regarding claim 4 Schmidt disclose in figure 3 and figure 5, **the LED as claimed in claim 1,** but fails to teach **wherein a proportion of M, in particular up to 30 mol %, is replaced by Li and/or La and/or Zn.**

Ellens teaches in paragraphs [0042], [0063] - [0065] that M can be La or Sr by there self and that those can be put in combination with host novel optical elements of $Si_2O_2N_2$ or $SiAlO_3N$. The novel hosts are very stable thermally and chemically and are of the same basic tetrahedral structure. The motivation to combine Ellens use of M=La with the host lattice and dopent of Schmidt to achieve, the predictable result, of different color hue and saturation.

It would have been obvious to one of ordinary skill in the art, at the time of the invention was made, to combine Schmidt's host lattice and dopent with Ellens' M=La. Both the Ellens and Schmidt are in the same field of endeavor (Light Emitting Devices) and are directed to the same problem sought to be solved (optimizing LED phosphor) and to change the color hue and saturation of the phosphor emission spectrum of the LED.

Regarding claim 5 Schmidt disclose in figure 3 and figure 5, **the LED as claimed in claim 1,** but fails to teach **wherein part of the SiN group in the oxynitridosilicate of formula $MSi_2O_2N_2$, in particular up to 30 mol %, is replaced by the AlO group.**

Ellens teaches in paragraphs [0043] – [0044] and [0063] the replacement SiN group with the AlO group. The motivation to combine is provide in paragraphs [0063] and [0064] where it sates the optically active materials of $Si_2O_2N_2$ or $SiAlO_3N$ can be substituted for each other since both have the same basic tetrahedral structure and the amount of nitride shifts the color spectrum.

It would have been obvious to one of ordinary skill in the art, at the time of the invention was made, to substitute Schmidt's host lattice with Ellens' host lattice. Both the Ellens and Schmidt are in the same field of endeavor (Light Emitting Devices) and are directed to the same problem sought to be solved (optimizing LED phosphor) and the optically active materials can be substituted for each other since both have the same basic tetrahedral structure.

Regarding claim 6 Schmidt disclose in figure 3 and figure 5, **the LED as claimed in claim 1,** but fails to teach **wherein a proportion of Eu, in particular up to 30 mol %, is replaced by Mn.**

Ellens teaches in paragraph [0061] the co-doping of Eu with MN^{2+} up to 4 times the amount of Eu which is more then 30 mol %. Ellens also provides motivation to combine in paragraph [0061] where he states the combination of co-doping allows for energy transfer to the co-dopant which will shift the peak emission characteristic.

It would have been obvious to one of ordinary skill in the art, at the time of the invention was made, to replace some Schmidt's dopant with Ellens' dopant. Both the Ellens and Schmidt are in the same field of endeavor (Light Emitting Devices) and are directed to the same problem sought to be solved (optimizing LED phosphor) and co-doping allows for energy transfer to the co-dopant which will shift the peak emission characteristic.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over US patent Grant Publication 2006/0011922 to Schmidt et al., herein refer to as Schmidt.

Regarding claim 11, Schmidt disclose in figure 1, **the LED as claimed in claim 1, wherein the LED is dimmable.** It would have been at least obvious to one of ordinary skill in the art that the LED can be dimmable by reducing the current input, as in accordance to needs. Refer to paragraph [0065] where there is a discussion on how optical characteristics can be changed according to needs.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Williams whose telephone number is (571) 270-5279. The examiner can normally be reached on Monday thru Friday 7:00 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Toan Ton can be reached on (571)272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron Williams/
Examiner, Art Unit 2889

/Toan Ton/
Supervisory Patent Examiner
Art Unit 2889